

SUMMARY OF THE OFFICE ACTION

Claims 49-56 have been rejected under 35 U.S.C. 103(a) as unpatentable over Wilson (U.S. Patent No. 5,156,139) in view of Briggs (U.S. Patent No. 5,879,149) and Otsbo (U.S. Patent No. 3,865,185).

RESPONSE TO THE OFFICE ACTION

Claims 49-56 have been rejected under 35 U.S.C. 103(a) as unpatentable over Wilson (U.S. Patent No. 5,156,139) in view of Briggs (U.S. Patent No. 5,879,149) and Otsbo (U.S. Patent No. 3,865,185).

The Office Action asserts that the response of applicant was not convincing because the arguments were directed at the individual references and not the combination of references. That assertion is incorrect. As with any rejection under 35 U.S.C. 103(a), applicant reviewed the primary reference (Wilson), determined what elements of the claimed invention were absent from that reference (which must be performed on the individual reference) and then analyzed the specific disclosure and teachings of the secondary references (Briggs and Otsbo) to show why those teachings did not correct the deficiencies of the primary Wilson reference. Applicant specifically raised issues concerning the quality of the teachings of the secondary references in overcoming the deficiencies of the Wilson reference and why the secondary references could not be combined with Wilson. Too many of those raised issues were preempted and avoided by the general assertion of analyzing the references separately.

The main (but not exclusive) differences between the claimed subject matter and the disclosure of Wilson that must be overcome by the teachings of the additional art are as follows:

| CLAIM 49 | WILSON | COMMENTS |
|--|---|--|
| d) a source of heated liquid coupled to the inlet and outlet ports of said second passageway to flow through said second passageway | Thermal heating element 14 to heat the fuel in the second passageway 22A. | The first passageway 16 contains air as a source of oxygen for combustion. |
| such that the heated liquid flow heats the manifold and transfers heat to oil in the first passageway to elevate the temperature of oil flowing in said first passageway as the oil is discharged from the nozzle; and | Thermal heating element 14 to heat the fuel in the second passageway 22A. | The first passageway 16 contains air as a source of oxygen for combustion. |

As can be seen, there is a fundamental difference between the underlying structure of the claimed technology and that of Wilson. The present invention uses fluid in specifically associated passageways to heat combustible oil fluid in adjacent passage ways. The "thermal heating element 14" of Wilson is not a flow mechanism, but is apparently a solid element which must be electrically heated to provide heat through its length. It is almost inconceivable that any other source of heat to a solid element could be provided as a designed function. In addition, there is only a single flow path 2A for fluid flow in the Wilson system. That flow path is repeatedly diverted as a critical element of the practice of the Wilson technology of flow director plugs:

"The block 20, the bore or bones 18 and the flow director plug or plugs 30 are designed to provide a fuel flow passage 22 which undulates upward and downward thereby increases the dwell time or the time during which fuel is within the block 20 and also creating substantial surface area through which heat is transferred or transferable from the block 20 when it is heated to the fuel flowing in such an undulating manner therethrough."

The rejection asserts that Briggs suggests the use of a coaxial set of cavities to carry fuel and air to a nozzle where the fuel is burned. Briggs, however, also teaches an electrically heated fuel system and requires that electrically heated system as part of his basis for improved technology. The electrical heating element of Briggs, as with the electrical heating element of Wilson, is a fundamental and required element of the practice of the respective technologies.

BRIGGS: "The improvement comprises an electrically-powered positive temperature coefficient (PTC) heating element for receiving power from a source. The PTC heating element is mounted in heat transfer relationship with oil contained within the passageway disposed upstream of the nozzle block assembly for heating the oil contained therein to about a preselected temperature."

The problem in this asserted combination is that in attempting to use Wilson as a base reference and add the multiple flow elements of Briggs to Wilson, the basic invention of Wilson (the "director plugs") must be discarded to provide the multiple fluid flow (air and oil), yet at the same time, both references require the use of electrical heating elements to make the systems work. Combining Briggs with Wilson does not "improve"

Wilson, but destroys its underlying invention with no specific benefit except to make the structure appear to be more similar to the claims of the invention.

More importantly, Briggs asserts that his structure, using electrical heating elements, improves performance against carbonization. The present invention, by removing the essential electrical elements of Wilson and Briggs, further improves performance of the heating systems against carbonization. It is the removal of the electrical elements in the fuel heating system **using the further recited physical structure of the claims** that makes this further requirement.

The addition of Otsbo to the combination of Wilson in view of Briggs does not address the problem or the solution provided by the present invention. Although Otsbo does make a general reference to heating fuels by using heated air (Figures 3 and 4, Column 2, line 42 through column 3, line 23), there is no indication that this form of heat exchange will solve the problem of carbonization which Briggs already asserts is improved by his electrical system and structure. As the rejection asserts that electrical heating, required by both Wilson and Briggs in their constructions is equivalent to the heating system of Otsbo, the results with respect to carbonization would be expected to be equivalent. In fact, by the constant temperature and regularity in the temperature provided to the system by the presently claimed invention, reduction of carbonization occurs. This is not an expected result from the use of the diverse systems of Ostbo and (Wilson Briggs). There is no expectation or predictability in the improvement provided from the teachings of the prior art. The subject matter as a whole cannot be obvious when the results are not obvious.

Additionally, as previously mentioned, the references cannot be easily combined because of the effort needed to randomly select individual element combinations from each of the references to match limitations in the claims. Claim 50 is an excellent basis for this analysis. In that claim 50, the at least two fluid flow cavities must be coaxially aligned, specifically "...wherein said second cavity is coaxially aligned upstream of said first cavity,..." Wilson absolutely excludes this orientation of heating element and oil flow stream for his invention to perform. **Briggs does not have coaxial flow of heat exchange as asserted. Note Figures 4 and 5 and the disclosure at column 5, line 26 through column 6, line 43.** The heat exchange occurs by direct contact of the oil passing through canister 84 which contains the electrically heated fins 108. This is clearly shown

in this disclosure. Therefore, it is incongruous and ineffective to assert that the air conduit 140 and fuel conduit 126 of Briggs teaches the use of coaxial movement of fluids as a heat transfer system for heating fuel. This is absolutely clear as Briggs uses the electrical heating elements 72 to heat the walls of the central opening 106 of the fins 108. Although Briggs may show coaxial fluid flow, it is not as a heating element, but as a mixing point on the nozzle. This combination is not instructive of the claimed subject matter. Otsbo also fails to teach or instruct such concentric flow. Otsbo shows flow through plates with cross channels 44, 45, 46, 47, 48 and 49 and does not have coaxial flow as required by claim 50.

Wilson in view of Briggs and Otsbo also do not teach the use of three cavities as recited in this claim where two cavities are the fluid exchange heating system and the third cavity is the atomizing air flow system. Even though Wilson shows air atomization, there are no two additional cavities combined with it in a nozzle. Again, random individual elements of the structures of the references are being combined to perform tasks and achieve goals not instructed by the references at the expense of the needs of the individual references according to their own teachings.

The attempt to combine the references to show that structure completely fails to be instructive and teach the obviousness of the recited structure and its results of reducing carbonization.

Claim 55 contains similar limitations as those in claim 50 and also recites that "...wherein first and second displaced, continuous channels are formed into said manifold and respectively terminate at separate inlet and outlet ports,..." Neither Briggs with a plate exchange and liquid flowing along the plates, nor Otsbo with a plate exchange and again liquid being diverted between multiple passages to flow along plates shows "continuous channels." As no reference except for Wilson shows a single continuous channel (even though serpentine), there is no possible way in which the three references would be combined to provide two aligned continuous channels adjacent each other for the flow of the oil and the heating fluid.

CONCLUSION

The rejections of record have been shown to be untenable. If the Examiner believes that any remaining issues may be resolved, she is courteously invited to call the attorney of record, Mark A. Litman at 952.832.9090, **Central Time Zone**, to negotiate on those remaining issues.

Submitted on behalf of the Client

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SIGNED BY



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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being facsimile transmitted to the United States Patent and Trademark Office, addressed to: Mail Stop AF, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on 25 February 2010

Mark A. Litman

Name

Signature

